AMENDMENT NO. 1 FEBRUARY 2021

TO

IS 9436 : 2018 PERFORMANCE REQUIREMENTS AND METHODS OF TEST FOR WHEELS FOR PASSENGER CARS, QUADRICYCLES AND MINI GOODS CARRIERS

(First Revision)

(*First cover page, title and page* 1) — Substitute the following for the existing title:

Indian Standard

IS 9436 : 2018 PERFORMANCE REQUIREMENTS AND METHODS OF TESTS FOR WHEELS FOR PASSENGER CARS, QUADRICYCLES AND MINI GOODS CARRIERS

(First Revision)

(*Foreword*, *para* 2 *and para* 3) — Substitute the following for the existing paras:

“This standard was first published in 1980. This revision has been undertaken to align this standard with international practices. This standard is in agreement with the ISO 3006 : 2015 ‘Road vehicles — Passenger car wheels for road use — Test methods’, issued by the International Organization for Standardization. It also includes the performance requirements apart from test methods. In this revision the aluminium wheels and temporary wheels have also been included.

Price Group 2

In the formulation of this standard, assistance has also been derived from SAEJ 328_ 201603 'Wheels — Passenger Cars and Light Truck —Performance Requirements and Test Procedures', issued by the Society of Automotive Engineers (Inc), USA and ISO 3006 : 2015 'Road vehicles — Passenger car wheels for road use — Test methods".

(*Page* 1, *clause* **1**) — Substitute the following for the existing clause:

'1 SCOPE

This standard specifies laboratory test methods and performance requirements including certain essential fatigue strength characteristics of wheels intended for but not limited to vehicles of categories L7, M1 and N1 as defined in IS 14272.

The test methods are:

a) Dynamic cornering fatigue test, and
b) Dynamic radial fatigue test.'

(*Page* 1, *clause* **3.3.1**) — Substitute the following for the existing clause:

'**3.3.1** *Inset* **—** The offset is the distance between the mounting face of the disc and the rim centerline. This distance is called inset when the mounting face is outside of the rim centerline.'

(Price Group)

(*Page* 1, *clause* **3.3.2**) — Substitute the following for the existing clause:

'**3.3.2** *Outset* **–** The offset is the distance between the mounting face of the disc and the rim centerline. This distance is called outset when the mounting face is inside of the rim centerline.'

(*Page* 1, *clause* **4**) — Substitute the following for the existing clause:

'4 GENERAL

Only fully processed new wheels/rims which are representative of wheels/rims intended for the vehicle shall be used for the tests. No wheel/rim shall be used for more than one test.'

(*Page* 1, *clause* **5.1.2.1**) — Substitute the following for the existing clause:

'**5.1.2.1** *Preparation*

Clamp the rim of the wheel securely to the test machine with the help of suitable adaptors/jigs. The adaptor face of the test machine shall have equivalent mounting systems to those used on the vehicle. The mating surface of the test adaptor and wheel shall be free of excessive scoring and deformation, and excessive build-up of paint, dirt or foreign matter.

Attach the load arm and adaptor assembly to the mounting surface of the wheel using studs or bolts, and nuts which are in good condition, lubricated or non-lubricated in accordance with the intended vehicle application (as specified by the vehicle manufacturer), and are representative of those used on the vehicle. Tighten these wheel nuts or bolts at the beginning of the test to the vehicle or wheel manufacturer specified torque values.

Wheel bolts or nuts may be retorqued during the test.'

(*Page* 1, *clause* **5.1.2.2**) — Substitute the following for the existing clause:

'**5.1.2.2** *Bending Moment Application*

To impart a bending moment to the wheel, apply a force parallel to the plane of the wheel mounting surface at a specified distance l (moment arm) of 0.5 m to 1.4 m, as shown in Fig. 1.

Maintain the bending moment within ± 2.5 percent of the calculated value.'

(*Page* 2, *clause* **5.1.3**) — Substitute the following for the existing clause:

'**5.1.3** *Bending Moment Determination*

Determine the bending moment M (Force × Moment arm) is given in Newton-metres, by the formula :

$$M = (\mu.\mathrm{R} + d)\, Fv \times S$$

where

μ = assumed coefficient of friction developed between tyre and road (*see* Table 2);

R = static loaded radius, in metres, of the largest tyre to be used on the wheel as specified by the vehicle or wheel manufacturer;

d = inset or outset (positive for inset; negative for outset), of the wheel, in metres;

Fv = maximum vertical static load on the wheel or the wheel load rating in Newtons, as specified by the vehicle or wheel manufacturer; and

S = accelerated test factor (*see* Table 2).

NOTE — For values of μ and S, *see* Annex A.'

(*Page* 2, *clause* **5.1.4**) — Substitute the following for the existing clause :

'**5.1.4** *Minimum No. of Performance Cycles to be Completed*

The wheel rim shall withstand a minimum no. of cycles without failure as specified in Table 2 and Table 4, prior to test termination.'

[*Page* 2, *clause* **5.1.5** (a)] — Substitute the following for the existing clause:

'a) Inability of the wheel to sustain the calculated test bending moment; and'

(*Page* 3, *clause* **5.2.1**) — Substitute the following for the existing clause:

'**5.2.1** *Equipment*

The test machine shall be equipped with a means of imparting constant radial load as the wheel rotates. There are many means of imparting radial loads. The suggested equipment incorporates a driven rotatable drum which presents a smooth surface wider than the loaded test tyre section width. The recommended minimum external diameter of the drum is 1 700 mm ± 1 percent.

The test wheel (single application) and tyre fixture shall provide loading normal to the surface of the external surface and inline radially with the centre of the test wheel and drum. The axes of the drum and test wheel shall be parallel (*see* Fig. 2).

The mating surfaces of the test adaptor and wheel shall be free of excessive scoring and deformation, and excessive build-up of paint, dirt or foreign matter.'

(*Page* 3, *Fig*.2, Key) — Delete.

(*Page* 4, *clause* **5.2.4**) — Substitute the following for the existing clause:

‘**5.2.4** *Minimum No. of Cycles to be Completed*

The wheel rim shall withstand a minimum no. of cycles without failure as specified in Table 3 and 5, prior to test termination.’

[*Page* 4, *clause* **5.2.5** (a)] — Substitute the following for the existing clause:

‘a) Inability of wheel to sustain the load or tyre pressure; and’

(*Page* 4, *clause* **7**) — Substitute the following for the existing clause:

‘7 MARKING

7.1 Wheel rims shall be durably and legibly marked with the following:

a) Size designation as per IS 10694 (Part 1),
b) Name or trade-mark of the wheel rim manufacturer,
c) Date of manufacturing preferably in the form of year and month or year and quarter of the year (for example 2009 indicates Sept 2020 ; 20 IV indicates fourth quarter of 2020); and
d) Rim bead seat contour type, if applicable.

7.2 The markings shall be made as per **4** of IS 10694 (Part 1).

8 BIS CERTIFICATION MARKING

8.1 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

8.2 The application for certification shall contain at least the technical information as specified in Annex B.’

(*Page* 4, *Table* 2) — Substitute the following for the existing table:

‘Table 2 Test Factors and Minimum Cycle Requirements for Wheels in Normal Highway Service — Dynamic Cornering Fatigue Test

(*Clauses* 5.1.3, 5.1.4 *and* A-1)

Sl No. (1)	Wheel Type (Material) (2)	‘S’ (3)	‘μ’ (4)	Minimum No. of Performance Cycles to be Completed (5)
i)	Ferrous all	1.6	0.7	18 000
ii)	Cold formed aluminium 5 000 series	1.8		50 000
iii)	Aluminium cast and forged	2.0		50 000

NOTE — With 3 percent less magnesium content.’

(*Page* 5, *Table* 3) — Substitute the following for the existing table:

‘Table 3 Test Factors and Minimum Cycle Requirements for Wheels in Normal Highway Service — Dynamic Radial Fatigue Test

(*Clauses* 5.2.3, 5.2.4 *and* A-1)

Sl No. (1)	Wheel Type (Material) (2)	‘K’ (3)	Minimum No. of Performance Cycles to be Completed (5)
i)	Ferrous all	2.25	400 000
ii)	Aluminium all	2.5	600 000

(*Page* 5, *Table* 4) — Substitute the following for the existing table:

‘Table 4 Test Factors and Minimum Cycle Requirements for Temporary Use Wheels — Dynamic Cornering Fatigue Test

(*Clauses* 5.1.4 *and* A-1)

Sl No. (1)	Wheel Type (Material) (2)	‘S’ (3)	‘μ’ (4)	Minimum No. of Performance Cycles to be Completed (5)
i)	Ferrous all	1.6	0.7	9 000
ii)	Cold formed aluminium 5 000 series	1.8		25 000
iii)	Aluminium cast and forged	2.0		25 000

NOTE — With 3 percent less magnesium content.’

(*Page* 5, *Table* 5) — Substitute the following for the existing table:

‘Table 5 Test Factors and Minimum Cycle Requirements for Temporary Use Wheels — Dynamic Radial Fatigue Test

(*Clauses* 5.2.4 *and* A-1)

Sl No.	Wheel Type (Material)	‘K’	Minimum No. of Performance Cycles to be Completed
(1)	(2)	(3)	(5)
i)	Ferrous all	1.65	400 000
ii)	Aluminium all	1.80	600 000

(*Page* 6, *Annex* B) — Substitute the following for the existing:

ANNEX B

(*Clauses* 6.2 *and* 8.2)

INFORMATION TO BE SUBMITTED FOR CERTIFICATION OF WHEEL RIMS

B-1 Following information shall be submitted for certification of wheel rims:

1 Manufacturer’s Name and Address

2 Telephone No.

3 Fax No.

4 E-mail address

5 Contact person

6 Wheel rim designation

7 Wheel rim category (*Disc wheel/Wheel with demountable rim*)

8 Wheel type

8.1 Material [Light Alloy (Aluminium, Magnesium, etc)/Ferrous (Steel, etc)]

8.2 Wheel mounting holes (Nos.)

8.3 Maximum vertical (Front/Rear) axle load capacity (kN)

8.4 Recommended inflation Service Pressure (kPa)

9 Inset/Outset (mm)

10 Dynamic loaded radius (mm)

10.1 Static loaded radius (mm)

11 Tightening torque for studs and nuts

11.1 Size of Nut/Stud

12 Detail of necessary accessories (if applicable)

12.1 Suitable for tubeless tyre mounting

13 Drawing, sufficiently detailed to permit identification of the type. They shall also show the position intended for the approval/certification mark and for the wheel markings

(TED 07)

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